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JUN 21 1996
Federal Communications Commission
Office of Secretary

THOMAS J. KELLER
DIRECT DIAL NUMBER
(202) 371-6060

June 21, 1996

VIA HAND DELIVERY

Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, N.W.
Room 222
Washington, DC 20554

Re: Ex Parte Presentation in ET Docket No. 95-18

Dear Mr. Caton:

Pursuant to Section 1.1206(a)(2) of the Commission's Rules, this is to notify you that on June 20, 1996 Leo R. Fitzsimon and Thomas J. Keller, representing the Association of American Railroads (AAR), Prudence Parks, representing UTC, the Telecommunications Association, Robert M. Gurss, representing the Association of Public-Safety Officials-International, Inc. ("APCO") and John Reardon, representing the American Petroleum Institute ("API") made a written and oral ex parte presentation to the following:

Office of Engineering and Technology
- Bruce Franca
- Dr. Lynn L. Remly
- Sean White
- Charles J. Iseman

International Bureau
Donald H. Gips
- Damon C. Ladson
- Karl A. Kensinger
- Jonathan Stern

Wireless Bureau
- Michelle Farquhar
- Jennifer Warren
- David Horowitz

Office of Commissioner Ness
- David R. Siddall

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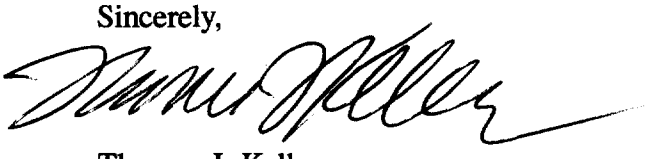
Copies of the written materials presented are enclosed. The oral presentation summarized the position of the parties in their written Comments, Reply Comments and Responses to the Supplemental Comments of Comsat Corporation in ET Docket No. 95-18.

In accordance with Section 1.1206 of the Commission's Rules, an original and one copy of this letter and the enclosures are being filed with your office.

Any questions concerning this matter should be directed to the undersigned.

Sincerely,



Thomas J. Keller
Counsel for AAR

Enclosures

cc (w/o enc.):

Bruce Franca
Dr. Lynn L. Remly
Sean White
Charles J. Iseman
Donald H. Gips
Damon L. Ladson
Karl A. Kensinger
Jonathan Stern
Michelle Farquhar
Jennifer Warren
David Horowitz
David R. Siddall

INCUMBENT VIEWS
CONCERNING COMSAT's MSS - FS SHARING PROPOSAL:

- COMSAT mischaracterized the findings of WRC-95 regarding MSS-FS sharing.
  - No conclusions were reached at WRC-95.
  - Additional studies are required for WRC-97.
- Studies have not demonstrated conclusively that MSS and FS can share safely the 2.1 GHz band.
  - ICO software is not conclusive.
  - Working Parties 8D and 9D are studying this issue internationally.
  - TIA is studying this issue domestically.
- Reliance on international sharing criteria is inappropriate due to material differences in the performance characteristics between U.S. and international FS and MSS systems.
- Incumbents simply cannot afford any interference.
  - Public Safety requirements.
  - Non-FCC requirements.
  - Liability issues.
- MSS operators must be required to pay all relocation costs of FS users, pursuant to the Commission's microwave relocation rules for other emerging technologies
  - $3 billion is not prohibitive cost.
  - Relocation is inevitable if FCC reallocates 2.1 GHz band.
  - COMSAT's amortization assumptions are not realistic and do not take into account potential acceleration of the sharing timetable.
- The interference potential from FS into MSS is significant

SUMMARY OF MICROWAVE INCUMBENT SYSTEMS

The American Petroleum Institute ("API") is a national trade association representing approximately 300 companies involved in all phases of the petroleum and natural gas industries, including exploration, production, refining, marketing, and transportation of petroleum, petroleum products and natural gas. The petroleum and natural gas industries use their 2.1 GHz facilities:

- to support the search for and production of oil and natural gas
- to ensure the safe pipeline transmission of natural gas, crude oil and refined petroleum products
- for the processing and refining of energy sources
- for delivery to industrial, commercial, and residential customers
- there are over 110 petroleum and natural gas licensees operating over 2,900 facilities in the 2.1 GHz band

The U.S. railroad industry deploys and depends on a sophisticated and comprehensive interrelated radio communications network consisting of both mobile and fixed point-to-point communications systems and facilities. The railroads use private fixed microwave systems that operate on frequencies in the 2.1 GHz band to meet critical safety and reliability requirements in their day-to-day operations. These uses include:

- train movement orders from centralized dispatchers for more than 1.3 million train cars on more than 215,000 miles of track
- remote control of track switches and train signals
- relay of defect detector data to operations center
- relay of data to and from central operations center for new "Positive Train Control" systems

The Association of Public-Safety Communications Officials-International, Inc. ("APCO") is the nations' oldest and largest public safety communications organization, with over 12,000 worldwide members involved in the management and operation of police, fire, emergency medical, forestry-conservation, highway maintenance, disaster relief, and other public safety communications facilities. Much of the 2.1 GHz band is currently allocated in the U.S. for Private Operational-Fixed Microwave

operations and state and local government public safety agencies are among the largest users of the band.

- there are more than 4,000 public safety licensees of 2.1 GHz microwave facilities

- most of these facilities provide the backbone for critical police, fire emergency medical and other public safety mobile communications networks

UTC, the Telecommunications Association, is a national representative on communications matters for the nation's electric, gas, water and steam utilities and natural gas pipelines. Approximately 2,000 such companies are members of UTC, ranging in size from large combination electric-gas-utilities serving millions of customers, to small rural electric cooperatives and water districts serving only a few thousand customers.

- electric utilities depend upon reliable and secure communications facilities for load management control and management of the nationwide electrical grid

- utilities hold licenses for over 3,500 facilities in the 2.1 GHz band

RESOLUTION GT PLEN-3

AGENDA FOR THE 1997 WORLD RADIOCOMMUNICATION CONFERENCE

The World Radiocommunication Conference (Geneva, 1995),

considering

a) that in accordance with Nos. 118 and 126 of the Convention of the International Telecommunication Union (Geneva, 1992), and having regard to Resolution 1 of the Additional Plenipotentiary Conference (Geneva, 1992), the general scope of the agenda for a world radiocommunication conference should be established four years in advance and a final agenda shall be established two years before the conference;

b) Resolution 3 of the Plenipotentiary Conference (Kyoto, 1994);

c) the relevant resolutions and recommendations of previous world administrative radio conferences (WARC) and world radiocommunication conferences (WRC),

recognizing

that this Conference identified a number of urgent issues requiring further examination by the 1997 World Radiocommunication Conference (WRC-97),

resolves

to recommend to the Council that a world radiocommunication conference be held in Geneva in late 1997 for a period of four weeks, with the following agenda:

1 on the basis of proposals from administrations and the Report of the Conference Preparatory Meeting, and taking account of the results of WRC-95, to consider and take appropriate action in respect of the following topics:

1.1 requests from administrations to delete their country footnotes or to have their country's name deleted from footnotes, if no longer required, within the limits of Resolution [COM4-1];

1.2 issues remaining from WRC-95 including consideration of the VGE Report in accordance with Resolution [COM4-3] and any essential changes to Articles **S4, S7, S8, S9, S11, S13, S14** and Appendices **S4** and **S5** of the simplified Radio Regulations adopted by WRC-95 to ensure consistency between all of their provisions;

1.3 review of Appendix **S7 [28]** to the Radio Regulations, taking into account Resolution **60 (WARC-79)**, Resolution **712 (Rev.WRC-95)** and Recommendation **711 (WARC-79)**;

1.4 examination of, and taking necessary decisions on, the question of the HF bands allocated to the broadcasting service in the light of developments to date and the results of the studies carried out by the Radiocommunication Sector, and review of Article **17 [S12]** of the Radio Regulations in accordance with Resolution [COM4-2];

1.5 based on the results of the studies to be carried out under Recommendation [GT PLEN-consider changes to the Radio Regulations, as appropriate;

1.6 matters related to the maritime mobile and maritime mobile-satellite services:

1.6.1 the provisions of Chapters **IX** [Appendix **S13**] and **NIX** [Chapter **SVII**] of the Radio Regulations, as stipulated in Resolution **331 (Mob-87)**, and appropriate action in respect of the issues dealt with in Resolutions **200 (Mob-87)**, **210 (Mob-87)** and **330 (Mob-87)**, including maritime certification and licensing issues related to Chapter **[SIX]** of the Radio Regulations, taki into account that the global maritime distress and safety system (GMDSS) shall be fully implemented in 1999;

1.6.2 the use of Appendix **18 [S18]** to the Radio Regulations in respect of the VHF band for maritime mobile communications, and the use and extension of UHF channels contained in **S5.287**, taking into account Resolution **310 (Mob-87)**;

1.6.3 Article **61 [S53]** of the Radio Regulations relating to the order of priority of communications in the maritime mobile service and in the maritime mobile-satellite service;

1.6.4 review, and if necessary, revision of the provisions related to the NAVTEX coordination in order to release ITU from the obligation to undertake operational coordination for this service operating on 490 kHz, 518 kHz and 4 209.5 kHz, in the light of the consultations undertaken with the International Maritime Organization (IMO) (see Resolution [COM4-7]);

1.6.5 use of the new digital technology in the maritime radiotelephony channels;

1.7 review of Appendix 8 to the Radio Regulations taking into account Recommendation **66 (Rev.WARC-92)**;

1.8 the possible deletion of all secondary allocations from the band 136 - 137 MHz, which is allocated to the aeronautical mobile (R) service on a primary basis, in accordance with Resolution **408 (Mob-87)** and in order to meet the special needs of the aeronautical mobile (R) service;

1.9 taking into account the needs of other services to which the relevant frequency bands are already allocated:

1.9.1 issues concerning existing and possible additional frequency allocations and regulatory aspects as related to the mobile-satellite and fixed-satellite services including consideration of WRC-95 Resolutions [PLEN-1], [COM5-4, COM5-5, COM5-6, COM5-7, COM5-8, COM5-9, COM5-11], [GT PLEN-6] and Recommendation **717 (Rev.WRC-95)**;

1.9.2 Resolutions **211 (WARC-92)**, **710 (WARC-92)** and Resolution **712 (Rev.WRC-95)**;

1.9.3 Recommendation **621 (WARC-92)**;

1.9.4 frequency allocation issues related to the needs of the Earth exploration-satellite service, which are not covered in the above-mentioned Resolutions, namely:

1.9.4.1 allocation of frequency bands above 50 GHz to the Earth exploration-satellite (passive) service;

RECOMMENDATION 717 (REV.WRC-95)

FREQUENCY SHARING IN BANDS SHARED BY THE MOBILE-SATELLITE SERVICE AND THE FIXED, MOBILE AND OTHER TERRESTRIAL SERVICES BELOW 3 GHz

The World Radiocommunication Conference (Geneva, 1995),

considering

a) that the World Administrative Radio Conference (Malaga-Torremolinos, 1992) made frequency allocations for the mobile-satellite service shared with other terrestrial services below 3 GHz;

b) that this Conference has adopted sharing criteria for these bands allocated to the mobile-satellite service which require further examination;

c) that both geostationary and non-geostationary satellites may be operated in the mobile-satellite service;

d) that the Radiocommunication Assembly (Geneva, 1995) approved Recommendations ITU-R IS.1141, IS.1142 and IS.1143, while identifying certain issues related to frequency sharing between the mobile-satellite service and terrestrial services requiring further study, some of them urgent (see Questions ITU-R 201/8 and 118-1/9),

recommends that ITU-R

study the remaining and urgent issues relating to frequency sharing between the mobile-satellite service and terrestrial services below 3 GHz and report to the 1997 World Radiocommunication Conference (WRC-97) through the Conference Preparatory Meeting,

recommends that administrations

submit contributions relating to these studies to ITU-R, as a matter of urgency,

recommends that the 1997 World Radiocommunication Conference

address the above issues and take appropriate action on them.

RESOLUTION GT PLEN-4

URGENT STUDIES REQUIRED IN PREPARATION FOR THE 1997 WORLD RADIOCOMMUNICATION CONFERENCE

The World Radiocommunication Conference (Geneva, 1995),

considering

a) that the agenda of this Conference included consideration of items for the agendas for the 1997 World Radiocommunication Conference (WRC-97) and the 1999 World Radiocommunication Conference (WRC-99);

b) that items for the agenda for 1997 have been identified in Resolution [GT PLEN-3];

c) that the 1995 Radiocommunication Assembly established a Special Committee to Address the Review of Regulatory/Procedural Matters, *inter alia*, regulatory issues for WRC-97,

noting

the important progress in ITU-R studies relevant to the preliminary agenda for WRC-97,

resolves

1 that ITU-R Task Group 10/5 shall present a report on the progress of studies on Question ITU-R 212/10 to the 1996 Conference Preparatory Meeting (CPM-96);

2 that both the ITU-R Special Committee to Address the Review of Regulatory/Procedural Matters and ITU-R Task Group 10/5 shall complete the work identified in Resolution [GT PLEN-2] (WRC-95);

3 that ITU-R Working Party 10-11S shall present a report on the progress of studies on Question ITU-R 85-1/11 to CPM-96;

4 that both the ITU-R Special Committee to Address the Review of Regulatory/Procedural Matters and Working Party 10-11S shall complete the work identified in Resolution [GT PLEN-1];

5 that ITU-R shall complete studies on the topics identified in this Resolution and its Annex and report the results of those studies to CPM-97,

instructs

1 CPM-96 to take this Resolution into account when planning the work in preparation for WRC-97;

2 the Director of the Radiocommunication Bureau to bring this Resolution to the attention of the meeting of ITU-R study group Chairmen and Vice-Chairmen.

draft2/12/96 **WRC-97 ADVISORY COMMITTEE**
INFORMAL WORKING GROUP (IWG)

WORK PROGRAM

IWG-2B
MSS Between 1 and 3 GHz, Including Feederlinks*

IWG-2B should develop proposals and recommendations relating to the following elements:

Agenda Item 1.9.1

Resolution 116 [COM5-4 (WRC-95)]. Preparing appropriate material for and participating in urgent studies for the CPM-97 in order to review power flux-density values in No. [865A] S5.511A of the Radio Regulations relating to the band 15.4-15.7 GHz and to determine out-of band emission limits for space station assignments in the 15.4-15.7 GHz band to protect services in the band 15.35-15.4 MHz.

Resolution 117 [COM5-6 (WRC-95)]. Allocation of frequencies for fixed-satellite service in the band 15.45-15.65 GHz for use by NGSO MSS feederlinks.

Resolution 717 [COM 5-11 (WRC-95)]. Review of allocations to MSS in the 2 GHz range with a view to harmonizing allocations and dates of access on a worldwide basis. IWG-2B should develop proposals and justification for aligning 2 GHz allocations worldwide.

Other Matters

Resolution 25 [PLEN-3 (WRC-95)]. Developing any material relevant to the concerns expressed in this resolution.

Resolution 114 [COM5-3 (WRC-95)]. Use of the band 5091-5150 MHz by NGSO MSS feederlinks, specifically with regard to aeronautical services that may use that band;

Resolution 115 [COM5-2 (WRC-95)]. Calculating the power flux-density at the geostationary-satellite orbit in the band 6700-7075 MHz used for non-geostationary-satellite MSS systems.

Resolution 212 (Rev. WRC-95). Develop positions relating to FPLMTS , considering that the United States does not intend to mandate standards for terrestrial FPLMTS or PCS-type services. And considering that it has allocated the 1850-1990 MHz band for PCS and has identified spectrum from 1990-2025 MHz and 2160-2200 MHz for MSS.

Resolution 213 (Rev. WRC-95). Sharing studies of the band 1675-1710 MHz with a view to using that band for MSS.

Resolution 716 [COM5-10 (WRC-95)]. Use of frequency bands in the 2 GHz range by the fixed service and by the mobile-satellite service and associated transitional arrangements. IWG-2B should place emphasis on transition arrangements that will ease the relocation of 2 GHz terrestrial services, thereby making the bands more useable for MSS.

Resolution 719 [GT-PLEN-4 (WRC-95)]. Urgent studies required in preparation for the 1997 World Radiocommunication Conference.

Recommendation 104 [COM5-B (WRC-95)]. Developing power flux-density and e.i.r.p limits for feederlinks of NGSO MSS feederlinks for protection of geoatationary satellite service networks in fixed-satellite service bands where No. (2613) S22.2 of the Radio Regulations applies.

Recommendation No. 105 [COM5-C (WRC-95)]. Determining the coordination area around earth stations for geostationary-satellite networks in the fixed-satellite service and for NGSO MSS feederlinks earth stations that operate in the opposite transmission direction.

Recommendation 717 (Rev. WRC-95). Frequency sharing in bands shared by MSS and terrestrial services below 3 GHz.

Recommendation 721 [COM5-A (WRC-95)]. Frequency sharing in the bands 1610.6-1613.8 MHz and 1660-1660.5 MHz between MSS and the radio astronomy service.

Allocation Matters. IWG-2B should address spectrum allocation matters to make available sufficient spectrum in the 1-3 GHz range to meet current and projected demand for MSS. These matters should include whether to pursue at WRC-97 general MSS allocations in the 1.5/1.6 GHz bands and developing proposals and strategies to secure 2 GHz MSS allocations and dates of access common across all three Regions. IWG-2B should also examine proposals of other administrations wishing to implement MSS networks in the 1-3 GHz range and develop appropriate U.S. positions and

proposals in response.

Technical and Operational Matters. IWG-2B should identified and address technical and operational constraints on the use of spectrum in the 1-3 GHz range MSS networks with a view to easing these constraints._

Regulatory and Procedural Provisions. IWG-2B should identify and refer to IWG-1 for incorporation into that group's work. any changes to regulatory and procedural provisions necessary to ease coordinating, implementing and operating MSS networks in the 1-3 GHz frequency bands;

Note: IWG-2B should also address issues deemed appropriate for its consideration by the Committee Chair and the FCC representatives to IWG-2.

Deadlines:

Recommended proposals, positions and studies should be forwarded for consideration by the Committee of the Whole, the Steering Committee and the Federal Communications Committee as they are agreed upon within IWG-2B. Other deadlines. for example, for periodic full Committee reports, will be established by the WRC-97 Advisory Committee Chair.

* except Ka-Band feederlinks

ANNEX TO RESOLUTION GT PLEN-4

Urgent studies required in preparation for WRC-97

- Sharing studies concerning the possible use of the band 1 675 - 1 710 MHz by the mobile-satellite service, in accordance with Resolution **213 (Rev.WRC-95)**.
- Issues dealing with allocations to space services, in accordance with Resolution **712 (Rev.WRC-95)**.
- Issues relating to frequency sharing between the mobile-satellite service and terrestrial services at frequencies below 3 GHz, in accordance with Recommendation **717 (Rev.WRC-95)**.
- Criteria to be applied for the non-GSO fixed-satellite service sharing situations listed in *considering further* of Resolution [PLEN-1].
- Sharing between the FSS and the FS in the 20 GHz band when used bidirectionally by the FSS to provide feeder links for non-geostationary satellite systems in the mobile-satellite service, in accordance with Resolution [COM5-1].
- Calculation of the power flux-density at the geostationary orbit in the 7 GHz band used for feeder links for non-geostationary systems of the mobile-satellite service in the space-to-Earth direction of transmission, in accordance with Resolution [COM5-2].
- Allocation of frequencies to the FSS in the band 15.4 - 15.7 GHz for use as feeder links for non-geostationary-satellite networks operating in the mobile-satellite service, in accordance with Resolution [COM5-4].
- Allocation of frequencies to the fixed-satellite service in the band 15.45 - 15.65 GHz (Earth-to-space) for use as feeder links for non-geostationary satellite networks operating in the mobile-satellite service, in accordance with Resolution [COM5-6].
- Development of interference criteria and methodologies for coordination between feeder links for non-GSO MSS networks and GSO FSS networks in the 20 GHz and 30 GHz bands, in accordance with Resolution [COM5-7].
- Power flux-density level applicable in frequency band 137 - 138 MHz shared by the mobile-satellite service and the terrestrial services, in accordance with Resolution [COM5-5].
- Determination of coordination areas between geostationary and non-geostationary feeder-link earth stations of different administrations operating in opposite directions of transmission, in accordance with Recommendation [COM5-C].
- Sharing studies concerning the use of the bands below 1 GHz by the non-GSO mobile-satellite service, in accordance with Resolution [COM5-8].

EXHIBIT E

INTERNATIONAL TELECOMMUNICATION UNION

RADIOCOMMUNICATION STUDY GROUPS

Document 8D/XX-E
Document 9D/YY
17 November 1995
Original: English only

Draft
(Version 2)

Chairmen of ITU-R Study Groups 8 and 9

FURTHER STUDIES ON FREQUENCY SHARING BETWEEN THE MOBILE-SATELLITE SERVICE AND THE FIXED SERVICE BELOW 3 GHz

1. Introduction

Following the decisions of the second Radiocommunication Assembly (Geneva, October 1995), and taking into account the decisions of the 1995 World Radiocommunication Conference (Geneva, October-November 1995) (WRC-95), this contribution suggests a future working arrangement for joint study by Working Parties 8D and 9D on frequency sharing between the mobile-satellite service (MSS) and the fixed service (FS) below 3 GHz.

2. Decisions of the 1995 Radiocommunication Assembly and WRC-95

2.1 The 1995 Radiocommunication Assembly approved the draft Recommendations [Doc. 2/6], [Doc. 2/7] and [Doc. 2/8] submitted from Study Group 2. They are now official Recommendations ITU-R IS.1141, IS.1142 and IS.1143, respectively, all of which deal with MSS/FS frequency sharing.

Their titles are as follows:

Rec. ITU-R IS.1141 Sharing in the frequency bands in the 1-3 GHz frequency range between the non-geostationary space stations operating in the mobile-satellite service and the fixed service

Rec. ITU-R IS.1142 Sharing in the frequency bands in the 1-3 GHz frequency range between geostationary space stations operating in the mobile-satellite service and the fixed service

Rec. ITU-R IS.1143 System specific methodology for coordination of non-geostationary space stations (space-to-Earth) operating in the mobile-satellite service with the fixed service

2.2 In addition, the Assembly decided that further studies on MSS/FS sharing should be jointly carried out by Study Groups 8 and 9, and that the above three ITU-R Recommendations should be assigned to Study Groups 8 and 9.

2.3 The WRC-95 adopted the following Resolutions and Recommendation which are related to MSS/FS sharing:

Resolution 46 (Rev. WRC-95) Interim procedures for the coordination and notification of frequency assignments of satellite networks in certain space services and the other services to which certain bands are allocated.

Resolution COM5-10 Use of frequency bands 1 980 - 2 010 MHz and 2 170 - 2 200 MHz in all three Regions, and 2 010 - 2 025 MHz and 2 160 - 2 170 MHz in Region 2 by the fixed and mobile-satellite services and associated transition arrangements.

Recommendation 717 (Rev. WRC-95) Frequency sharing in frequency bands shared by the mobile-satellite service and the fixed, mobile and other terrestrial radio services below 3 GHz.

It should be noted that the scope of Recommendation 717 (Rev. WRC-95) has been expanded so that it now covers all frequency bands below 3 GHz. This indicates that further study by Study Groups 8 and 9 should cover issues related to the frequency bands below 1 GHz, too.

2.4 Therefore, it is necessary to establish an appropriate joint working arrangement of Study Group 8 (Working Party 8D) and Study Group 9 (Working Party 9D). The following section discusses this matter.

3. Suggested joint working arrangement

3.1 One possible approach for joint study will be to create a Joint Working Party or Joint Task Group according to § 2.7 of the revised Resolution ITU-R 1. But such group should be created only when absolutely necessary, because of its financial implications and additional meetings required.

3.2. In order to minimize the impacts on both participants and the ITU budget, the following approach is suggested, at least for an initial stage, without creating a formal joint group.

Working Party 8D will appoint a Liaison Rapporteur (as defined in § 5.2 of the revised Resolution ITU-R 1) and, if necessary, one or more Rapporteurs (as defined in § 2.11 of the revised Resolution ITU-R 1). For our purpose, it may be more appropriate to use the term "Principal Rapporteur" instead of "Liaison Rapporteur".

The role of the Principal Rapporteur will be to coordinate the work of Rapporteurs and to carry out coordination with WP 9D. The role of a Rapporteur will be to carry out study on a specific subject matter for which WP 8D has a primary responsibility, in close collaboration with an Associate Rapporteur appointed by WP 9D. A number of Associate Rapporteurs may be appointed by WP 8D, too, in order to assist Rapporteurs of WP 9D.

3.3 Similarly, WP 9D will also nominate a Principal Rapporteur and, if necessary, one or more Rapporteurs to work in close collaboration with WP 8D for those items of which WP 9D has primary responsibility, and one or more Associate Rapporteurs to assist WP 8D Rapporteurs.

3.4 The Assembly Document 2/1001 (the report of the Chairman of Study Group 2), in its Annex 1, identified 12 items requiring further study to assist in frequency sharing in the band 1-3 GHz, out of which seven items are related to MSS/FS sharing. In order to carry out the joint study efficiently, it seems appropriate to assign the main responsibility for study of each of the seven items to either WP 8D or WP 9D.

Along this line, the following assignment is suggested:

A Study items for which WP 8D is mainly responsible

A1 The development of the standard computer program (SCP) for the coordination procedure (see Recommendation ITU-R IS.1143) (see Note 1)

A2 The development of the computer program for use to facilitate bilateral coordination of the non-GSO MSS (space-to-Earth) with the fixed service (see Notes 1 and 2)

B Study items for which WP 9D is mainly responsible

B1 Consideration of the standard reference bandwidth for interference calculations e.g. 1 MHz, 4 kHz, or others depending on interference scenarios

B2 The development of the pfd limits for the MSS (space-to-Earth) systems to share with the FS analogue systems in the frequency bands 1 492 - 1 525 and 1 525 - 1 530 MHz (see Note 3)

B3 The aggregate interference of point-to-multipoint fixed service at low e.i.r.p. to the MSS (space-to-Earth)* needs study for a larger number of systems

B4 Considerations of combinations of non-GSO CDMA/FDMA and TDMA/FDMA systems for computation of the aggregate interference to victim fixed service receivers (see Recommendation ITU-R IS.1143) (see Note 4)

C Study items which require further consideration before assignment (see Note 6)

C1 Consideration of technical and operational matters in the phased transitional approach for bands shared between the MSS (Earth-to-space) and the fixed service (see Note 5)

3.5 It should be noted that some studies cannot be carried out without close cooperation from the other side. For example, the item B3 requires definition of satellite parameters by WP 8D. In this case, it is definitely necessary to appoint WP 8D Associate Rapporteur for item B3.

Note 1 - Study items A1 and A2 should be jointly developed to result in a single computer program that would accommodate replacing the FS reference parameters with the specific parameters of the FS system requiring bilateral coordination.

Note 2 - FS system parameters to be used in bilateral coordination should be developed mainly by WP 9D.

Note 3 - The WRC-95 adopted coordination thresholds for the FS analogue systems in the bands 1 492 - 1 525 and 1 525 - 1 530 MHz. Therefore, further study on item B2 may not be necessary.

Note 4 - It may be desirable to take account of B4 in developing computer programs for A1 and A2.

Note 5 - In this connection, the WRC-95 adopted Resolution COM5-10 (dealing with transitional arrangements) which requested the ITU-R to develop the necessary planning tools as soon as possible to assist those administrations considering a replanning of their terrestrial fixed networks in the 2 GHz range. WP 9D should consider what planning tools can be provided.

Note 6 - Additional issues, including those related to the frequency bands below 1 GHz should be included, as appropriate.

4. Responsible Study Group for adopting draft Recommendations

4.1 Even if a joint study is conducted under the supervision of two Study Groups, it is desirable that only one responsible Study Group will formally adopt a draft Recommendation in order to simplify the approval process.

4.2 An appropriate principle for determining the responsible Study Group may be as follows (see Note 7):

---

* Probably "(Earth-to-space)" is correct instead of "(space-to-Earth)" as appears in Doc. 2/1001.

- a draft Recommendation giving constraints on, or protection criteria for, MSS will be adopted by Study Group 8;
- a draft Recommendation giving constraints on, or protection criteria for, FS will be adopted by Study Group 9;
- in case of a mixed draft Recommendation, the responsible Study Group will be decided through consultation.

4.3 All of the Recommendations ITU-R IS.1141, IS.1142 and IS.1143 are of a mixed type. However, if the contents are closely examined, it seems appropriate that Study Group 8 be responsible for these three Recommendations. (In future, it seems appropriate that these Recommendations include a statement that any revision of the Recommendation should be jointly undertaken by Study Groups 8 and 9).

4.4 Attention should be also given to the examination of the desirability and feasibility of rearranging a Recommendation into two parts, one for Study Group 8 and another for Study Group 9.

4.5 It is interesting to note that the Study Group responsible for study of a certain issue and the responsible Study Group for the relevant Recommendation may not necessarily be the same. For example, if a study on item B1 results in a new reference bandwidth, it will lead to the modifications of Recommendations ITU-R IS.1141, IS.1142 and IS.1143. This fact demonstrates the need of close cooperation between WP 8D and WP 9D.

Note 7 - For example, in case of FSS to FS interference in SF series Recommendations, Rec. ITU-R SF.615 (Maximum allowable values of interference from FSS to FS) falls in the category of "FS protection criteria", and Rec. ITU-R SF.358 (Maximum pfd limit for satellites) gives a constraint on FSS.

5. Conduct of studies

5.1 Studies should be carried out as much as possible by correspondence using modern means of communication, including E-mail. Principal Rapporteurs and other Rapporteurs should keep close contact with each other. The joint study should demonstrate an efficiency of WP 8D and WP 9D participants.

5.2 The two Principal Rapporteurs are expected to establish a work plan with the agreement of WP 8D and WP 9D, which should be placed under constant supervision and review. If really necessary, the two Principal Rapporteurs may propose to organize (an informal) joint meeting to accelerate and/or finalize the studies. This joint meeting may take advantage of normal meetings of either WP 8D or WP 9D.

5.3 Rapporteurs may be assisted by other experts. For this purpose, it seems appropriate to prepare a list of participants who wish to communicate with each Rapporteur. Such participants may come from both Study Groups.

5.4 In principle, all studies (except for those which may be found not urgent) should be completed within this study period.

5.5 Needless to say, a maximum use should be made of normal meetings of WP 8D and of WP 9D. Principal Rapporteur and other Rapporteurs of WP 8D are invited to participate in the meetings of WP 9D and vice versa. The March 1996 meetings of Working Parties 8D and 9D are in overlap for several days. Such opportunity should be used for an effective joint study.

5.6 If necessary, the following provision of Resolution ITU-R 1 may be also utilized.

"8.7 Contributions for consideration by correspondence submitted well before the date of the meeting should be distributed promptly by the Director".

5.7 In future new study issues may emerge which are not foreseen at the present time. They will also require a joint study by WP 8D and WP 9D in a similar way. This principle may also apply to the case where a third party Study Group is involved.

5.8 Source codes for all computer programs developed for implementing the relevant study items should be made available for review by Working Parties 8D and 9D.

6. Provisional nomination of Rapporteurs

Taking advantage of the WRC-95, the Chairmen of Study Groups 8 and 9 made an informal consultation with delegates attending the Conference. In order to accelerate the studies, the following provisional nomination was suggested:

Principal Rapporteurs:

for WP 8D:	United States of America ?
for WP 9D:	United States of America

Rapporteurs:

	WP 8D (Rapporteur)	WP 9D (Associate Rapporteur)
A1	France	
A2	Japan	

	WP 8D (Associate Rapporteur)	WP 9D (Rapporteur)
B1		Japan
B2		
B3		United Kingdom
B4		[Canada]

	WP 8D	WP 9D
C1		

7. Preparation of an input to the CPM-97

Recommendation 717 (Rev. WRC-95) is included in § 1.9.1 of the WRC-97 agenda (see Resolution GT PLEN-3 of WRC-95) and Resolution COM5-10 is referred to as an urgent issue in the annex to Resolution GT PLEN-4. Therefore, an input to the CPM-97 on this issue should be prepared.

Resolution 46 (Rev. WRC-95) is not explicitly included in the WRC-97 agenda, but in view of their urgency, it seems necessary to prepare an input to the CPM-97 on these issues too. Working Parties 8D and 9D are requested to make an appropriate arrangement for such preparations.

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April 24, 1996

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Ms. Nancy J. Thompson
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VIA FACSIMILE

Re: FCC ET Docket No. 95-18;
Amendment of Section 2.106 of the
Commission's Rules to Allocate
Spectrum at 2.1 GHz for Use
by the Mobile Satellite Service
COMSAT Computer Simulation Meeting

Dear Nancy:

In order to facilitate the upcoming meeting at your offices concerning COMSAT's computer simulation software, a group of Fixed Services ("FS") users convened a series of conference calls during the weeks of April 15 and April 22, 1996. The following persons participated in one or more of those conference calls:

- Rick Smith of Texaco, Inc.
- Sean Stokes and Dennis Guard of UTC, the Telecommunications Association
- George Kizer, Bill Knight and Phil Salas of Alcatel Network Systems
- Denis Couillard of Harris Farinon
- Thu Nguyen of Radio Dynamics, Inc.
- Bill Rummler of AT&T
- Thomas Keller on behalf of the Association of American Railroads
- John Reardon on behalf of the American Petroleum Institute

The participants discussed their general concern that they have received insufficient information concerning the nature of

COMSAT's proposed ICO system and the equations to be used in COMSAT's computer simulation software. On several occasions, for example, I have requested from Jeff Binckes, Ray Crowell and Sam Nguyen a copy of COMSAT's software so that FS users could study it ahead of time. Unfortunately, I have not yet received that software.

The group also identified specific information which it felt the FS community would need in order to intelligently study the issue of sharing between the FS and Mobile Satellite Services ("MSS") in the band 2165-2200 MHz ("the 2.1 GHz band"). Provided herewith is a list of preliminary questions; these questions are designed to shape the dialogue at Thursday's meeting by providing COMSAT with guidance concerning the need of FS users for more complete information. FS users hope that these questions will provide some guidance explaining such basic issues as the parameters of COMSAT's planned system and the specific equations and assumptions which underly the computer simulation software.

Also provided herewith is a partial list of answers to questions which COMSAT posed to FS users and a letter from George Kizer of Alcatel Network Systems. As you will see, many of COMSAT's questions are answered, but in order to answer most of the questions completely, the participants felt obliged to know the operating characteristics of the ICO system, as well as the equations and assumptions underlying COMSAT's software. For example, the participants were hesitant to characterize an average FS system because they want to avoid a situation where the average scenario becomes the standard. Instead of the average scenario, FS users are highly concerned with the worst case scenario.

FS users such as utilities, railroads, pipelines and refineries cannot afford to conduct business based on the laws of probability and averages: they must ensure the public safety and protect the environment. They cannot tolerate even one instance of harmful interference. Thus, the participants from the FS community find statistical averages largely irrelevant; the bottom line for protection of public safety is not the average scenario of harmful interference, but the worst-case scenario of harmful interference.

PRELIMINARY QUESTIONS:

- What equations are used in the simulation program?
- How do these equations differ from and comport with the WRC-95 Final Acts?

- Please provide what COMSAT believes to be the worst case satellite alignment/transmission scenarios that would impact the FS users:

  - Have you considered multiple MSS system interaction with multiple satellites systems and various multiple access techniques?

  - What multiple access technique is planned for use with COMSAT's MSS?

  - How will the situation evolve as MSS loading increases?

- What FS unfaded RSL is being modeled in the simulations?

- FS users are concerned that certain ITU documents refer to "studies" but do not include cites to the specific studies; please provide actual copies (not cites) of any and all scientific studies which have addressed the issue of MSS/FS sharing below 3 GHz and upon which COMSAT relies.

PRELIMINARY ANSWERS:

- Many existing FS systems have unfaded RSL's of -50dbm. This still allows for fade margins around 40 db because of the sensitive receiver thresholds which are common in the 2130-2150 MHz and 2180-2200 MHz band.

- An FS antenna is typically Type B per Section 94.75 of the FCC's Rules.

- The typical antenna at 2.1 GHz is a 6 foot parabolic dish, with gain of approximately 29.5db, and between 5-8 degree, 3 dB beamwidth.

- Modulation = Analog FDM/FM 48 channel 800 kHz

- Modulation = Digital 256 QAM

- Transmit Power = 1-2 watts = 30-33 dBm

- Polarization = Worst Case

- Height of terrain at station = Worst Case

- Propagation Model = Barnett Vigants from TIA Bulletin 10-G

* * * *

I hope this information is helpful and look forward to discussing these issues further at the meeting on Thursday. In the meantime, should you have any questions, please let us know.

Cordially yours,

John Reardon

Enclosure

cc: Charles Iseman
Alex Latker
Sean White
Sam Nguyen
Jeff Binckes
Ray Crowell
Rick Smith
Sean Stokes
Dennis Guard
George Kizer
Bill Knight
Phil Salas
Denis Couillard
Thu Nguyen
Bill Rummler
Thomas Keller

NETWORK SYSTEMS

MEMORANDUM

To John Rearden c.c.

From George Kizer

Date April 23, 1996

Ref Today's Conference Call Regarding COMSAT Technical Data Request

The following is my input for consolidation in your response to Sam Nguyen of COMSAT:

1. The following are typical characteristics of fixed point to point radio systems operating in the approximately 2.2 GHz band in the United States (Consideration should be given to Canadian systems which have other characteristics such as transmission bandwidths as wide as 29 MHz.):

a. Analog Systems

Operational Bandwidth:	800 kHz
Modulation Type:	48 Channel FDM-FM
Transmitter Power:	2 Watts, Constant Power
Nominal Received Signal Level (RSL):	-50 dBm
RSL at 30 dB S/N Threshold:	-92 dBm
Receiver Noise Figure (Temperature):	6 dB (1155 ^{0}K)

b. Digital Systems

Operational Bandwidth:	3.5 MHz
Modulation Type:	4 DS-1, 256 or 64 QAM
Transmitter Power:	1 Watt, up to 10 dB ATPC
Nominal Received Signal Level (RSL):	-30 or -40 dBm
RSL at 10^{-4} BER Threshold:	-73 or -83 dBm
Receiver Noise Figure (Temperature):	4 dB (728 ^{0}K)
Transmitter T/I:	39 or 33 dB

c. Receiver Filter Characteristics

N/A - interference is co-channel, desired signal occupies entire transmission bandwidth (allocated bandwidth and occupied bandwidth are the same)

d. Typical Antennas

Type:	Parabolic
Polarization:	Linear, Horizontal and/or Vertical
Elevation Angle:	$+1^{0}$ to -1^{0}
Azimuth:	Any
Height:	0 to 1.5 miles AMSL
Feeder Loss:	0 dB
Typical Size:	6 or 8 Feet
Main Beam (Peak) Gain:	29 to 32 dB (See Attachment, Table 11-2)
Side Lobe Suppression:	Per Attachment, FCC Antenna Standards, 1,850 to 2,500 MHz, Category B (Assume 0 dB for 0^{0} to 5^{0})

e. Link Type

Bi-directional
Full period duplex
Any location in the United States
Path link typically 30 miles

f. Performance Estimation Methodology

Performance Objectives
Bulletin 10F, Para. 4.2.2. attached

Fading Model
Bulletin 10F, Para. 4.2.3 (ATT/Bell Labs Barnett-Vigants Model), attached
NOTE: ITU-R Rec. 530 is not recognized by the North American fixed point-to-point microwave industry

Interference Criteria
For constant power and frequency interference use I/N and C/(N+I) methods as described in Bulletin 10F, Paras. 2.5.4, 2.5.5 and A-6, attached.
For other systems, specific methods must be determined.

2. The main objective of the meeting later this week in Washington is to discuss sharing of fixed microwave frequencies with the mobile satellite service. The exact characteristics of the mobile satellite systems are not well defined to the fixed microwave community. We have heard some indication that the mobile satellite system designers anticipate changing satellite and/or earth station power and/or frequencies.

All current industry accepted methods of estimating interference effects into fixed microwave radio systems assume constant power and frequency interfering signals. If the mobile satellite systems will vary power and/or frequency, the first issue to resolve is an appropriate method of estimating interference into fixed microwave systems.